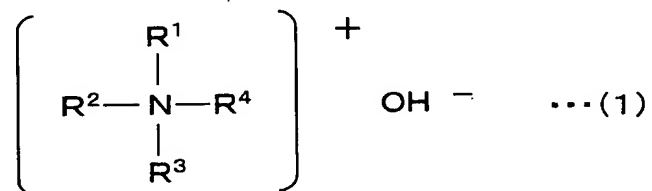


What is claimed is:

1. A surface treatment method characterized by treating a surface with a supercritical fluid, wherein

5 an ammonium hydroxide expressed by the formula (1) below is added as a co-solvent or a reactant to said supercritical fluid:



10 where each of  $\text{R}^1$  to  $\text{R}^4$  in the formula (1) independently denotes an alkyl group, hydroxy-substituted alkyl group, aryl group or hydrogen.

2. A surface treatment method according to claim 1, wherein said surface has a structural body thereon.

15

3. A surface treatment method according to claim 2, wherein said structural body is a fine structural body with a hollow portion, a micromachine, or an electrode pattern.

20

4. A surface treatment method according to claim 2, wherein said surface is that of a photomask utilized for lithography.

5. A surface treatment method according to claim 1, wherein said supercritical fluid is carbon dioxide.

25

6. A surface treatment method according to claim 1, wherein said supercritical fluid is further added with a surfactant material.

7. A surface treatment method according to claim 6, wherein said surfactant material is a polar solvent.

- 5 8. A surface treatment method characterized by treating a surface with a supercritical fluid, wherein  
an alkanolamine expressed by the formula (2) below is added as a co-solvent or a reactant to said supercritical fluid:



- 10 where each of  $R^1$  to  $R^3$  in formula (2) independently denotes an alkyl group, hydroxy-substituted alkyl group, aryl group or hydrogen.

9. A surface treatment method according to claim 8, wherein  
15 said surface has a structural body thereon.

10. A surface treatment method according to claim 9, wherein said structural body is a fine structural body with a hollow portion, a micromachine, or an electrode pattern.

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11. A surface treatment method according to claim 9, wherein said surface is that of a photomask utilized for lithography.

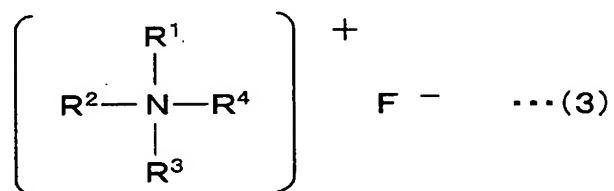
12. A surface treatment method according to claim 8, wherein  
25 said supercritical fluid is carbon dioxide.

13. A surface treatment method according to claim 8, wherein said supercritical fluid is further added with a surfactant material.

14. A surface treatment method according to claim 13, wherein said surfactant material is a polar solvent.

5 15. A surface treatment method characterized by treating a surface with a supercritical fluid, wherein

an amine fluoride expressed by the formula (3) below is added as a co-solvent or a reactant to said supercritical fluid:



10 where each of  $R^1$  to  $R^4$  in the formula (3) independently denotes an alkyl group, hydroxy-substituted alkyl group, aryl group or hydrogen.

16. A surface treatment method according to claim 15, wherein  
15 said surface has a structural body thereon.

17. A surface treatment method according to claim 16, wherein said structural body is a fine structural body with a hollow portion, a micromachine, or an electrode pattern.

20

18. A surface treatment method according to claim 16, wherein said surface is that of a photomask utilized for lithography.

19. A surface treatment method according to claim 15, wherein  
25 said supercritical fluid is carbon dioxide.

20. A surface treatment method according to claim 16, wherein

said supercritical fluid is further added with a surfactant material.

21. A surface treatment method according to claim 20, wherein  
5 said surfactant material is a polar solvent.

22. A surface treatment method characterized by treating a surface with a supercritical fluid, wherein

hydrofluoric acid is added as a co-solvent or a reactant  
10 to said supercritical fluid.

23. A surface treatment method according to claim 22, wherein said surface has a structural body thereon.

15 24. A surface treatment method according to claim 23, wherein said structural body is a fine structural body with a hollow portion, a micromachine, or an electrode pattern.

25. A surface treatment method according to claim 23, wherein  
20 said surface is that of a photomask utilized for lithography.

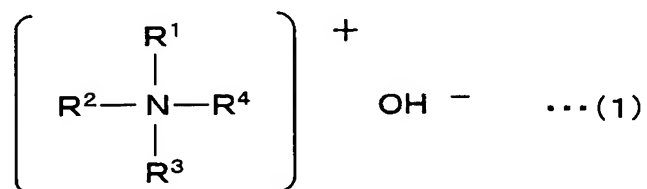
26. A surface treatment method according to claim 22, wherein said supercritical fluid is carbon dioxide.

25 27. A surface treatment method according to claim 22, wherein said supercritical fluid is further added with a surfactant material.

28. A surface treatment method according to claim 27, wherein  
30 said surfactant material is a polar solvent.

29. A semiconductor device obtainable by a surface treatment method characterized by treating a surface with a supercritical fluid, wherein

an ammonium hydroxide expressed by the formula (1) below is added as a co-solvent or a reactant to said supercritical fluid:



where each of  $\text{R}^1$  to  $\text{R}^4$  in the formula (1) independently denotes an alkyl group, hydroxy-substituted alkyl group, aryl group or hydrogen.

30. A semiconductor device obtainable by a surface treatment method characterized by treating a surface with a supercritical fluid, wherein

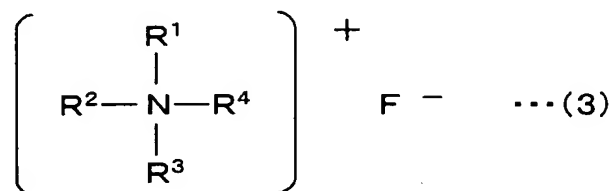
an alkanolamine expressed by the formula (2) below is added as a co-solvent or a reactant to said supercritical fluid:



where each of  $\text{R}^1$  to  $\text{R}^3$  in formula (2) independently denotes an alkyl group, hydroxy-substituted alkyl group, aryl group or hydrogen.

31. A semiconductor device obtainable by a surface treatment method characterized by treating a surface with a supercritical fluid, wherein

an amine fluoride expressed by the formula (3) below is added as a co-solvent or a reactant to said supercritical fluid:



5 where each of  $\text{R}^1$  to  $\text{R}^4$  in the formula (3) independently denotes an alkyl group, hydroxy-substituted alkyl group, aryl group or hydrogen.

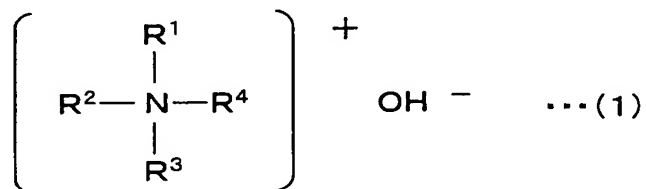
32. A semiconductor device obtainable by a surface treatment  
10 method characterized by treating a surface with a supercritical fluid, wherein

hydrofluoric acid is added as a co-solvent or a reactant to said supercritical fluid.

15 33. A method of fabricating a semiconductor device, said method comprising;

adding an ammonium hydroxide expressed by the formula (1) below as a co-solvent or a reactant to a supercritical fluid, and

20 treating a surface of said semiconductor device with said supercritical fluid:



where each of  $\text{R}^1$  to  $\text{R}^4$  in the formula (1) independently denotes an alkyl group, hydroxy-substituted alkyl group, aryl group

or hydrogen.

34. A method of fabricating a semiconductor device, said method comprising;

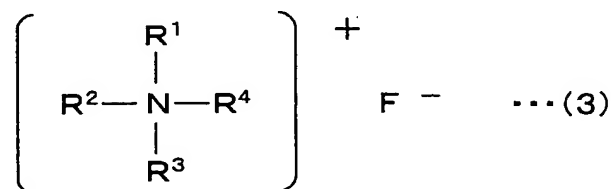
- 5        adding an alkanolamine expressed by the formula (2) below as a co-solvent or a reactant to a supercritical fluid, and  
       treating a surface of said semiconductor device with said supercritical fluid:



- 10    where each of  $R^1$  to  $R^3$  in formula (2) independently denotes an alkyl group, hydroxy-substituted alkyl group, aryl group or hydrogen.

35. A method of fabricating a semiconductor device, said method comprising;

- 15        adding an amine fluoride expressed by the formula (3) below as a co-solvent or a reactant to a supercritical fluid, and  
       treating a surface of said semiconductor device with said  
 20    supercritical fluid:



where each of  $R^1$  to  $R^4$  in the formula (3) independently denotes an alkyl group, hydroxy-substituted alkyl group, aryl group or hydrogen.

36. A method of fabricating a semiconductor device, said method comprising;

adding hydrofluoric acid as a co-solvent or a reactant to a supercritical fluid, and

5 treating a surface of said semiconductor device with said supercritical fluid.

37. A treatment apparatus comprising;

10 a treatment chamber for housing therein a substrate to be treated,

an opening through which said substrate is loaded and unloaded,

a lid provided with said opening for tightly closing the inner space of said treatment chamber,

15 a sealing member held between said treatment chamber and said lid, so that the inner space of said treatment chamber can be kept air-tight,

a fluid supply port provided with said treatment chamber, and

20 a fluid supply source connected to said fluid supply port, supplying a substance capable of having a form of supercritical fluid.

38. A treatment apparatus according to claim 37, wherein;

25 said fluid supply source is capable of supplying said substance capable of having a form of supercritical fluid in a gas form.

39. A treatment apparatus according to claim 37, further comprising;

30 a valve for discharging said substance capable of having



a form of supercritical fluid in said treatment chamber.

40. A treatment apparatus according to claim 39, further comprising;

5           a discharge fluid separation device connected to said valve.

41. A treatment apparatus according to claim 40, further comprising;

10           a heating means provided with said treating chamber for heating said supercritical substance.